The Mediating Role of Self-Efficacy on the Math Anxiety-Performance Relationship

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Abstract

Math anxiety typically has a negative relationship with math performance. This relationship is mediated by math self-efficacy. Other types of efficacy may also be important, however, such as one's efficacy in their ability to regulate their emotions, or perhaps more specifically their emotions during math. While small sample size (n=16) limits a full mediation analyses, results of a correlation suggest that emotional self-efficacy in math may serve as a mediator of the anxiety-performance relationship. Ongoing data collection should allow us to reach the necessary power to determine the mediating effects of math-specific emotional efficacy.

Literature Review

Math anxiety—feelings of fear and worry when thinking about or calculating math problems in academic and everyday settings (Hopko et al., 2001; Ashcraft & Faust, 1994; Ashcraft, 2001; Jameson, 2020)

Math self-efficacy—confidence in one's competence to successfully complete a specific math task (Neilson & Moore, 2003)

Emotional self-efficacy—confidence in one's competence to successfully perceive and regulate one's emotions (Palestro & Jameson, 2020)

SELF-EFFICACY

MATH ANXIETY → **MATH PERFORMANCE**
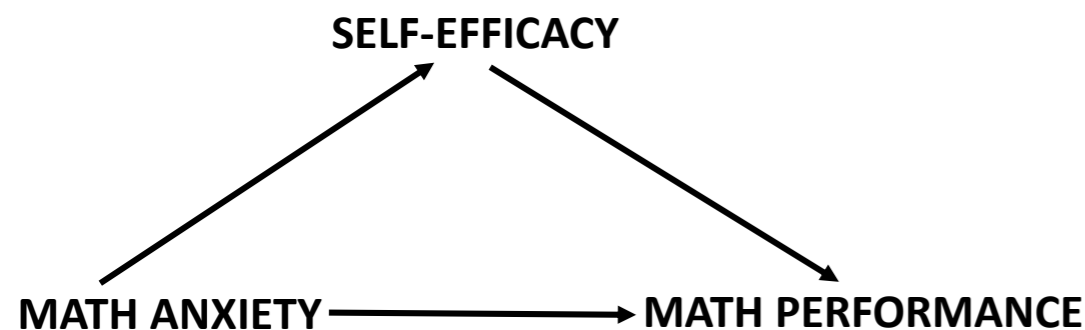
Highly math anxious students may need a more math-specific type of emotional efficacy than general emotional self-efficacy to mediate their anxiety-performance relationship.

Research Question: Does emotional self-efficacy in math have a direct effect on both math anxiety and math performance, suggesting it may serve as a mediator of this relationship?

Method

Participants-
- 16 undergraduate students (ongoing)

Measures-
- Abbreviated Math Anxiety Scale (AMAS; Hopko et al., 2003)
- Math Self-Efficacy Scale (MSES; Neilson & Moore, 2003)
- Emotional Self-Efficacy Scale (ESES; Kirk et al, 2008)
- Emotional Self-Efficacy in Math Scale (ESEM; created by the authors)
- Math computation subtest of the Wide-Range Achievement Test, 4th ed (WRAT4; 2006)

Procedures-
- Participants recruited from subject pool, signed up online, and received Qualtrics link
- Participants received course credit for their participation
- Consent form-->measures in counterbalanced order-->demographic questions

Results

Bivariate correlations between math anxiety, emotional self-efficacy in math, and math performance.

Table 1 shows significance levels of each direct correlation.

	ESEM	MA	MP
ESEM	-------	-0.085	0.083
MA	--------	--------	-0.063
MP	--------	--------	--------

Possible direct effects between emotional self-efficacy in math and other variables suggest a possible mediating role of emotional self-efficacy in math on the math anxiety-performance relationship.

Discussion

- The purpose of our study was to investigate the role of emotional self-efficacy in math on the existing relationship between math anxiety and performance.
- Our findings indicate negative correlations between emotional self-efficacy in math and math anxiety, and math anxiety and math performance, as well as a positve correlation between emotional self-efficacy in math and math performance.
- These correlations demonstrate the possible mediating role of emotional self-efficacy in math on the math anxiety-performance relationship.
- Data collection is ongoing, and our goal is to run an indirect effects analysis once we have reached a sample of 100 people.
- If additional analyses show a mediating role of emotional self-efficacy in math, this has possible implications for interventions with highly math anxious learners.

References

A full reference list is available from the lead author or faculty supervisor.

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